
Placenta as a newly identified source of hematopoietic stem cells.

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Public Summary:

This current opinion article highlights recent work that identified the placenta as a hematopoietic organ.

Scientific Abstract:

PURPOSE OF REVIEW: The lifelong stream of all blood cells originates from the pool of hematopoietic stem cells (HSCs) generated during embryogenesis. Given that the placenta has been recently unveiled as a major hematopoietic organ that supports HSC development, the purpose of this review is to present current advances in defining the origin and regulation of placental HSCs. **RECENT FINDINGS:** The mouse placenta has been shown to have the potential to generate multipotential myelo-lymphoid hematopoietic stem/progenitor cells de novo. The cellular origin of HSCs generated in the placenta and other sites has been tracked to the hemogenic endothelium by using novel genetic and imaging-based cell-tracing approaches. Transplantable, myelo-lymphoid hematopoietic stem/progenitor cells have also been recovered from the human placenta throughout gestation. **SUMMARY:** The discovery of the placenta as a major organ that generates HSCs and maintains them in an undifferentiated state provides a valuable model to further elucidate regulatory mechanisms governing HSC emergence and expansion during mouse and human development. Concurrent efforts to optimize protocols for placental banking and HSC harvesting may increase the therapeutic utility of the human placenta as a source of transplantable HSCs.

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